REMARKS / ARGUMENTS

The Examiner's "Response to Arguments" has been fully considered, and the all of the claims have been amended so as to make the invention more clearly defined by the claims and to overcome the cited prior art. Consequently, the issues raised in the "Examiner's Response" section have all been addressed by claim amendments so as to render all of the Examiner's objections and rejections of the claims moot and/or overcome.

In particular, the Examiner cites Nichani at Col. 7, lines 40-46, wherein it states that:

> "The trained windows to be searched within the field of view limit the extent of area **searched** and expedite the process of locating the **coarse** alignment **patterns**. These **coarse** alignment pattern **areas** of search should be selected to be **big enough to accommodate the uncertain orientation of the package at run time**."

By contrast, the amended claims now make it more clear that "a size of each of the non-overlapping sub-regions being **small enough** such that an **image-based inspecting method** can reliably **inspect** each of the sub-regions". In Applicant's invention, the coarse alignment tool is trained to find the region of interest **in its entirety**, so there is only **one** pattern to find with the coarse

alignment tool in Applicant's invention, not a **plurality** of patterns as is taught by Nichani. This is consistent with the fact that Applicant's invention as claimed involves a **single** search tree, as opposed to the Minimum Spanning **Forrest** of search trees in Nichani (e.g., see Abstract, lines 5-9).

Moreover, in Applicant's invention, as claimed in amended independent claims 1, 6, 14, 21, 27, 34, 35, and 36, for example, only a **fine** search tool is used to search within a **plurality** of non-overlapping sub-regions, whereas in Nichani, a **coarse** alignment tool searches in the plurality of windows (sub-regions), as stated in Col. 7, lines 43-46.

Further, the Examiner has also noted that "a conventional **inspecting** method is used to reliably inspect each window or "sub-region", citing Col. 12, lines 14-17 of Nichani, which states: "This pattern is located by Normalized Correlation which in this illustrative embodiment implementing Cognex vision system tools is provided by the Cognex **Search** tool." Note well that "Normalized Correlation" is **NOT** an **inspection** method – it is a **search** method, as is well-understood by those skilled in the art of machine vision.

Further, Nichani NEVER teaches, suggests, or motivates the use of an image-based inspection method, as now required by all of the claims, as herein amended. Instead, Nichani merely teaches three parameters that together are used to determine presence/absence of a check-mark (Col. 13, lines 40-57). This is NOT an image-based inspection method, such as Golden Template Analysis, or PatInspect, as taught by Applicants. An image-based inspection

method is needed in Applicant's invention so as to provide a difference image, and a match image, such as claimed in amended claims 8, 9. 16, 23, and 30, for example.

Regarding Ueda (Ueda et al. US 5,271,068, hereinafter "Ueda"), Ueda teaches character **recognition** that divides a single character region into a plurality of sub-regions so as to obtain a character code that represents the character to be recognized. Each sub-region is reduced to a **code** that represents the resemblance of the sub-region to a plurality of templates. Each sub-region is compared with a plurality of templates, the result being a match score (RESMB DEG), the match scores taken together result in the code that represents the entire single character (Col. 2, lines 50-55, and Fig. 14). The essential insight is that the **result** of each comparison of the sub-region with the template is **NOT an image**, but is instead a **single value**. The values that result from comparing sub-regions to templates ultimately results in character **recognition**, not character inspection. Thus, Ueda does **not** teach image-based inspection, either as an intermediate result, or as a final result.

By contrast, Ueda teaches a "features calculator [that] calculates quantified **features** in each sub-region based on a degree-of-resemblance between a template and image data in the sub-regions. When the features of each sub-region are calculated for all sub-regions constituting the single character area, **a character code** corresponding to the scanned character image data **is recognized** by the character code recognition device based on the

quantified features of each of all sub-regions." (see Abstract, lines 7-15). Thus, Ueda essentially **reduces** the information content of each sub-region to a code, whereas in Applicant's invention, as now claimed, the image-based inspection provides two images – a difference image and a match image. Any inspection method that does not produce an image cannot be called an "image-based" inspection method. Thus, Ueda does NOT teach "image-based" inspection, as now required by all the claims, as amended herein.

Further Ueda **teaches away** from "non-overlapping" sub-images, as now required by all of the amended claims. For example, Ueda teaches "It is **preferable** that the region divider, when dividing the character image data of the single character area into subregions, generates the subregions **so that adjacent subregions overlap**", Col 3, lines 17-20. **Again**, at Col. 3, lines 24-25, Ueda states that "the subregions are formed so that adjacent subregions **overlap**". Ueda further elaborates on the **motivation** for this aspect at Col. 3, lines 26-35. Ueda **AGAIN** teaches motivation to **AVOID** the "conventional method" of dividing an image "into contiguous (non-overlapping) rectangular subregions of equal size" at Col. 11, lines 35-36. This "conventional method" is in fact the method **taught and shown by Applicant** in Fig. 3 of the Specification. Ueda also states that use of this "conventional method" results in a **problem**, and "This problem is particularly frequent during character recognition of handwritten characters" (Col. 11, lines 47-49). Accordingly, Ueda states that "adjacent subregions are generated so that they **overlap** by <u>one-third</u>" (Col. 11, lines 50-

53). Thus, Ueda teaches **away** from the non-overlapping sub-regions of Applicant's invention, as taught therein, and as set forth in all the amended claims.

Regarding Nichani's minimum spanning forest, the Examiner admits that Nichani does not expressly state building a **single** search tree. However, the Examiner asserts that Nichani discloses that the number of trees can be manually input (Col. 10, lines 2-3). The Examiner then asserts that it would have been obvious to manually input only "a single search tree because it is well known in the art and would be a matter of design choice depending on the number of alignment points, citing (Col. 9, lines 64-67, Col 7, lines 1-15). However, Nichani always refers to "the number of trees" (**plural**), and the "MSF building mechanism constructs a MSF (minimum spanning forest) constituted by a **plurality** of trees, further stating that the "number of trees (**plural**) must be determined", and that "each alignment point serves as the root of a tree" (Col. 9, 65-66). Since each alignment point results from a coarse search tool result (Col. 11, lines 28-29), and the Examiner has asserted that there are multiple windows (citing Col. 7, lines 40-43) for running the coarse search tool, **then there must be <u>multiple</u> alignment points, and therefore <u>multiple</u> trees**.

Further, if there were only one tree, then there would be only one local alignment point. However, this is <u>not possible</u> in Nichani, since Nichani teaches a "hierarchical search methodology", wherein every check box can have **three** types of fixturing: fixturing from the course alignment, fixturing from a local

alignment point, and fixturing obtained from fine alignment (Col. 11, lines 57-65). Further, "local alignment points (plural) provide a mechanism to overcome the effects of local warping, minimizing errors and enhancing searching efficiency on a warped package surface" (Col. 12, lines 8-11). Thus, Nichani teaches that the **use of alignment points** (plural) in a "hierarchical search methodology" **provides efficiency**, and using only a single alignment point (and consequently a single minimum spanning tree) would **reduce** the hierarchy from three levels to only two levels, which is just like the prior art scheme of "coarse to fine", as is well-known in the art. Thus, using only a single alignment point would result in very low efficiency, according to Nichani. Thus, Nichani teaches **away** from using a **single** search tree, manually input or otherwise.

Moreoever, it would **not** be "a matter of design choice", as asserted by the Examiner, "depending on the number of local alignment points", since the number of local alignment points **depends** on the results of the coarse search results (Col. 11, lines 28-29), which are **not** under the control of the designer, but are a consequence of the characteristics of the warped image to be analyzed. Such warped images result in complex patterns that require a plurality of coarse search results, a plurality of corresponding local alignment points, and a plurality of minimum spanning trees so as to provide a minimum spanning forest (MSF), as is repeatedly stated throughout Nichani.

The Examiner asserts that Nichani discloses running a coarse alignment tool as claimed, citing Col. 6, lines 46-67, and Col. 7, lines 1-15. However, all of

the claims have been **amended** to make it more clear that the invention requires: "running a coarse alignment tool to approximately locate the <u>spatially distorted</u> pattern <u>in its **entirety**</u> within a region of interest <u>so as to provide an approximate location for a root sub-region of a **single** search tree"</u>. By contrast, Nichani teaches a "two point fixturing" scheme (Col. 11, lines 9-11), whereby only "two unique points or characteristics trained for coarse alignment are then located" (Col. 11, lines 15-16). In Nichani, "the [two] coarse alignment points are obtained by locating the trained unique patterns in the stored image by Normalized Correlation" (Col. 11, lines 16-19). Thus, Nichani does not teach what is required by Applicant's amended claims, i.e., "to approximately locate the spatially distorted pattern **in its entirety** within a region of interest", instead locating merely two "unique patterns in the stored image". The "two unique points or characteristics" represent <u>only a **portion** of the spatially distorted pattern</u>, thus they do not represent the spatially distorted pattern **in its entirety**, as required by the claims.

Further, "based on the train time and run time position of these [two] points, the translational and rotational parameters of the subject run time package are computed (Col. 11, lines 25-27), and "the translation and rotation parameters are used to predict the position of the **local alignment <u>points</u>** (**plural**)" (Col. 11, lines 28-29). By contrast, coarse location in Applicant's invention provides "an approximate location for a root sub-region of a **single** search tree", as required by the claims as amended herein.

Claims 1-4, 14, 17, 21, 24, 25, 27, and 28 were rejected under 35 USC 103(a) as being unpatentable over Nichani in view of Ueda.

Claims 1 and 27 have been amended such that they now require an "image-based" inspecting method. Neither Nichani nor Ueda teach an "image-based" inspecting tool or method, as explained in detail above. Thus, combining Nichani with Ueda would not result in Applicant's invention.

Further, neither Nichani nor Ueda teaches building a single search tree. Nichani teaches a forest of trees, and Ueda does not teach building a search tree or a plurality of search trees. Thus, this further demonstrates that combining Nichani with Ueda would not result in Applicant's invention.

Yet further, Neither Nichani nor Ueda teaches "training a coarse alignment tool for the region of interest in its entirety so as to enable providing at run time an approximate location for a root sub-region of the single search tree", as shown in detail above. Thus, combining Nichani with Ueda would not result in Applicant's invention.

Moreover, Ueda **teaches away** from using "non-overlapping" sub-regions, (now required in all claims, as amended), teaching instead the use of substantially overlapping subregions, and further providing reasons for NOT using "contiguous" or "non-overlapping" subregions, as explained in detail above. Thus, there is no teaching, suggestion, or motivation to combine Ueda with Nichani to obtain Applicant's invention. Since the requirement of "non-

overlapping sub-regions" exists throughout all the claims as now amended, Ueda clearly teaches away from the invention as set forth in the amended claims.

Accordingly, the rejection of claims 1 and 27 is deemed to be overcome.

Regarding claim 14, the arguments presented for claim 1 are applicable to claim 14. The region divider does not divide the region in its entirety, as required by amended claim 14. Further, Nichani does not disclose using coarse alignment for finding an approximate location for a root sub-region of a single search tree, as now required by amended claim 14. Nichani does not teach an image-based inspector, as now required by amended claim 14. Accordingly, the rejection of claim 14 is deemed to be overcome.

Regarding claim 21, the arguments presented for claim 1 and 14 are applicable to claim 21. Accordingly, the rejection of claim 21 is deemed to be overcome.

Regarding claims 2, 17, and 24, the arguments presented for claim 1 are applicable to claim 2, 17, and 24. Nichani does not disclose image-based inspection, as explained above. Nichani does not teach, suggest, or motivate approximating each of the sub-regions by an affine transformation. Moreover, claims 2, 17, and 24 depend from claims deemed to be allowable. Accordingly, the rejection of claims 2, 17, and 24 is deemed to be overcome.

Regarding claims 3, 25, and 28, these claims have been amended so as to make more clear that the search tree being built is a SINGLE search tree, not

a tree from among a Minimum Spanning Forest, as taught by Nichani. Accordingly, the rejection of claims 3, 25, and 28 is deemed to be overcome.

Regarding claim 4, as explained above, since both Nichani and Ueda both lack a plurality of elements of amended claim 1, combining Nichani and Ueda would not result in Applicant's invention as set forth in claim 1, and consequently as set forth in claim 4, which depends from claim 1. Accordingly, the rejection of claim 4 is deemed to be overcome.

Claims 6, 8, 10, 16, 23, 29, and 30 have been rejected as being unpatentable over Nichani in view of Ueda, and further in view of Companion et al. (6,330,354) ("Companion").

Regarding claim 6, neither Nichani, Ueda, or Companion teach the first element of claim 6, lacking two essential aspects: "running a coarse alignment tool to approximately locate the spatially distorted pattern in its entirety", and "so as to provide an approximate location for a root sub-region of a single search tree".

It has been previously established that Nichani does not teach "locating the pattern in its entirety", and Ueda is silent on this aspect. Companion performs alignment using only the "LM" 38 (metal layer) (Col. 3, lines 52-65, and Fig. 1, element 38). Since the LM 38 is NOT the "pattern in its entirety", Companion also fails to provide the needed teaching of the first element of claim

6. Thus, combining Nichani, Ueda, and Companion would not result in Applicant's invention.

Further, Ueda **teaches away** from using "non-overlapping" sub-regions, (now required in the second and third elements of claim 6, as amended), teaching instead the use of substantially overlapping sub-regions, and further providing reasons for NOT using "contiguous" or "non-overlapping" sub-regions, as explained in detail above. Thus, there is no teaching, suggestion, or motivation to combine Ueda with Nichani to obtain Applicant's invention. Since the requirement of "non-overlapping sub-regions" exists throughout all the claims as now amended, Ueda clearly teaches away from the invention as set forth in amended claim 6.

Moreover, Nichani teaches away from using a difference image as required by claim 6, and a match image, as required by claim 8. In the application discussed in Nichani, a check mark must be detected within boxes on a film package. It is the presence or absence of a check mark that must be detected (col. 13, lines 45-47). One of average skill in the art would immediately recognize that using a template matching approach to create a match image and a difference image would not be practical, due to the wide variety of check marks that could be drawn by a human hand marking within a box. Thus, nothing in Nichani teaches, suggests, or motivates the creation of a difference image, or a match image, since template matching would not be used in Nichani. Thus, Nichani teaches away from combination with Companion.

Further Companion teaches only a difference image, not a match image as required by claim 8, and only a difference image of a large portion of the image, not a plurality of non-overlapping sub-regions as required by the second element of claim 6. Moreover, Companion does not teach, suggest, or motivate the use of "sub-regions", or "non-overlapping" sub-regions. Thus, Companion also does not teach "a difference image for each of the non-overlapping sub-regions", as required by the third element of amended claim 6. Nor does Nichani or Ueda. Thus, combining Nichani, Ueda, and Companion would not result in Applicant's invention.

Moreover, neither Nichani, Ueda, nor Companion teach "using search tree information of a single search tree", Nichani teaching a plurality of search trees, Ueda and Companion not teaching any search tree.

Thus, it's clear that combining Nichani, Ueda, and Companion would not provide Applicant's invention, and there is no teaching, suggestion, or motivation to do so. In fact, the references teach away from combination.

Accordingly, the rejection of claim 6 is deemed to be overcome.

Regarding claim 29, the arguments analogous to those presented above for claims 6 and 27 are applicable to claim 29. Accordingly, the rejection of claim 29 is deemed to be overcome.

Regarding claims 8, 16, 23, and 30, Nichani does not teach "image-based inspection", as now required in amended claims 8, 16, 23, and 30 (which depends on claim 29). The Examiner admits that Nichani does not teach producing both a difference image and a match image. The Examiner asserts that Ueda discloses producing a correlation for each sub-region, citing Col. 8, lines 16-39. Ueda does NOT teach a **match** image. In fact, Ueda teaches only calculating "the **degree** of resemblance between the image data for the scanned sub-region and plural templates corresponding to the sub-region" resulting in a "vector defined by the plural degrees of resemblance" (Col. 8, lines 18-23). The degree of resemblance is just a single **value** (not an image, which consists of a two-dimensional array of values called "pixels" that together correspond to another image or object), and the degree of resemblance for a **plurality** of templates is a plurality of values, stored as a one-dimensional vector. **A vector of resemblance values is NOT an image**, and is certainly not a "match image" as required by Applicant's invention as claimed. Thus, again, Ueda does NOT teach a **match** image.

Companion also is silent on providing a "**match** image". Since none of Nichani, Ueda, or Companion teach a "match image", combining these references will not result in Applicant's invention as set forth in claims 8, 16, 23, and 30. Although Companion does teach combining difference images, Companion is silent on "combining difference images for **each of a plurality of**

non-overlapping sub-regions into a single difference image", as required by claims 8, 16, 23, and 30.

Further, amended claims 8, 16, 23, and 30 depend from independent claims deemed to be allowable for reasons explained above. Accordingly, the rejection of claims 8, 16, 23, and 30 is deemed to be overcome.

Regarding claim 10, the arguments analogous to those presented above for claim 2 are applicable to claim 10. Accordingly, the rejection of claim 10 is deemed to be overcome.

Claims 34-36 have been rejected under 35 USC 103(a) as being unpatentable over Nichani in view of He et al. (US 6,088,482) ("He"). Amended claims 34-36 now require "running a coarse alignment tool to approximately locate the pattern so as to provide an approximate location for a root sub-region of a **single** search tree". Since Nichani is silent on single search trees, and in fact teaches away from single search trees, Nichani does not teach, suggest, or motivate the element of claims 34-36 that requires coarse alignment for providing a root sub-region of a **single** search tree. Nichani teaches a plurality of search trees, i.e., a Minimum Spanning Forest of trees.

Further, Nichani does not teach "image-based" inspection that is clearly required by all of amended claims 34-36; Nichani teaches presence/absence detection of "check boxes".

Moreoever, "He" does not teach either "image based" inspection, or coarse alignment for providing a root sub-region of a single search tree.

The Examiner admits that Nichani does not teach combining all location information to produce a distortion vector field. However, the Examiner asserts that "He" teaches combining all location information to produce a distortion vector field for each sub-region, citing Fig. 10, and Col. 12, lines 33-39.

Claims 34-36 have been amended to more clearly define the invention. In particular, it is now more clear that the invention includes: "**comparing** the fine location information **with model location information** so as to provide a distortion vector for each non-overlapping sub-region; and **combining** all distortion vectors, one for each non-overlapping sub-region, so as to produce a distortion vector field;"

By contrast, He teaches "A smooth unidirectional vector field, which is zero at the bulls-eye is shown in Fig. 10. For example, such a vector field could be used to correct distortions caused by cylindrical warp of the symbol" (Col. 12, lines 35-39). This vector field is used to "tweak the grid" (Col. 12, line 35) (i.e., to "correction distortions") of black hexagons so they can be located more exactly (Col. 12, lines 33-35), to correct distortions.

He goes on to explain: "Variants of the foregoing technique may be employed. For example, after the orientation hexagons have been located and the grid for the primary message hexagons set up, the orientation hexagon locations could be refined to properly center black-white transitions found in the

image before the ECC is run" (Col. 12, lines 40-45). Thus, the vector field of He is used to **correct** distortions. He is silent on how the vector field is created.

By contrast, Applicant's vector field is **created** by "**comparing** the fine location information **with model location information** so as to provide a distortion vector for each non-overlapping sub-region; and **combining** all distortion vectors, one for each non-overlapping sub-region, so as to produce a distortion vector field", as now required by amended claim 34. Claims 35-36 are analogous.

The vector field of Applicant is then used for a different purpose than taught by He. He teaches correcting distortions. By contrast, Applicant teaches and claims "using the distortion vector field to make a pass/fail decision based on user-specified tolerances", as required by amended claim 34, for example.

The Examiner asserts that "He" teaches that's it's known to allow for pass/fail decisions based on user-specified tolerances, citing Col. 7, lines 46-48, yet these lines state merely that "the thresholds for rejection are tunable parameters based on the optical characteristic of the system", yet this teaching occurs in the context of "MaxiCode decoding", and particularly in the task of finding the "central finder pattern (bulls-eye)" of a MaxiCode (Col. 7, lines 24-25). The "tunable parameters" are never related to a vector field of any kind by "He". He is silent on using a vector field as "tunable parameters". Thus, He is silent on using a vector field in conjunction with making a pass/fail decision. These two elements are never taught by He to be cooperative for the purpose of "using the

distortion vector field to make a pass/fail decision based on user-specified tolerances", as required by claims 34, 35, and 36.

The Examiner also cites Col. 5, lines 21-23, which merely states: "Fig. 10 illustrates a vector field usable in the present invention to correct distortion of image data of a two dimensional code symbol", yet in Applicant's invention, the vector field is NOT used to correct distortion, but to provide input that is used to make "pass/fail" decisions also based on "user-specified tolerances", as required by claims 34, 35, and 36. Accordingly, the rejection of claims 34, 35, and 36 is deemed to be overcome.

Claims 5 and 20 have been rejected under 35 USC 103(a) as being unpatentable over Nichani and Ueda as applied to claims 1 and 14, and further in view of Aiyer et al. (5,777,729) ("Aiyer"). Although a golden template comparison method, such as GTC as discussed in Aiyer, is an image-based inspection as required by all the claims as now amended, Nichani teaches away from using image-based inspection methods. Nichani is clearly teaching presence/absence of check marks in boxes (Col. 13, lines 54-56) using a scoring function that reduces each candidate box with a check mark to a single value that is compared to a scoring threshold (Col. 14, lines 64-67).

The GTC method taught by Aiyer would not work in this context since GTC does not provide a scoring function, a single value from the scoring function, or a threshold value to compare with the single value. A Golden

Template is instead an image of a good sample. Since many check marks are possible within a box (different size, shape, style, etc of check marks), no single Golden Template could be used. For example, an "X" could be marked in a box and detected by Nichani, but be interpreted as not a check mark using a Golden Template of a check mark. Thus, combining Nichani with Aiyer would not work or be useful.

Moreover, Aiyer does not repair any of the deficiencies of Nichani or Ueda. Nor is there any teaching, suggestion, or motivation to combine Nichani with Aiyer in either reference. Accordingly, the rejection of claim 5 and 20 is deemed to be overcome.

Claims 7, 9, and 31 have been rejected under 35 USC 103(a) as being unpatentable over Nichani, Ueda, and Companion et al. (US 6,30,354) as applied to claim 6 and 27, and further in view of He. Claims 7, 9, and 31 have been amended such that they are now analogous to amended claim 34, and so the arguments analogous to those presented above for claim 34 are applicable to claims 7 and 31.

Regarding claim 9, the arguments analogous to those presented above for claim 34 are applicable to claim 9.

The Examiner asserts that Ueda discloses producing a correlation (match) for each sub-region, citing Col. 8, lines 16-39. Ueda does NOT teach a **match** image. In fact, Ueda teaches only calculating "the **degree** of resemblance

between the image data for the scanned sub-region and plural templates corresponding to the sub-region" resulting in a "vector defined by the plural degrees of resemblance" (Col. 8, lines 18-23). The degree of resemblance is just a single **value** (not an image, which consists of a two-dimensional array of values called "pixels" that together correspond to another image or object), and the degree of resemblance for a **plurality** of templates is a plurality of values, stored as a one-dimensional vector. **A vector of resemblance values is NOT an image**, and is certainly not a "match image" as required by Applicant's invention as claimed. Thus, again, Ueda does NOT teach a **match** (Examiner's "correlation") image.

Companion also is silent on providing a "**match** image", as required by amended claim 9. Since none of Nichani, Ueda, or Companion teach a "match image", combining these references will not result in Applicant's invention as set forth in claim 9. Although Companion does teach combining difference images, Companion is silent on "combining difference images for **each of a plurality of non-overlapping sub-regions** into a single difference image", as required by amended claim 9. Accordingly, the rejection of claim 9 is deemed to be overcome.

Claim 11 has been rejected under 35 USC 103(a) as being unpatentable over Nichani, Ueda, and Companion as applied to claim 6, and further in view ofo Miyake (US 6,009,213) ("Miyake").

Amended claim 11 calls for "using the fine location information from located ones of the non-overlapping sub-regions to interpolate location information for a non-overlapping sub-region when the non-overlapping sub-region cannot be located". By contrast, Miyaki teaches interpolation of **pixel value** information. Fig. 6 of Miyaki shows how pixel value information is transformed within a window, giving starting and interpolated values in windows 601 and 602, respectively (Col. 6, lines 1-4). Thus, Miyaki does not teach "interpolation" of fine location information as taught and claimed by Applicant. Applicant teaches and claims interpolation of fine location information, NOT interpolation of pixel values, as in Miyaki. Consequently, for this reason alone, combining Miyaki with Nichani, Ueda, and Companion would not result in Applicants' invention. Accordingly, the rejection of claim 11 under 35 USC 103(a) is deemed to be overcome.

Claim 12 has been rejected under 35 USC 103(a) as being unpatentable over Nichani, Ueda, and Companion, as applied to claim 6, and further in view of Dance. The Examiner asserts that Dance teaches predicting registration results. However, amended claim 12 requires "predicting location results ... when the at least one of the non-overlapping sub-regions **cannot be located by running the fine alignment tool**", which is clearly NOT taught by Dance. Instead, Dance uses the predicted position to measure image distortion **by comparing the predicted position with the measured (located) position of the registration**

dots" (Col. 10, lines 6-10). So, Dance **both** predicts location and actually **performs** location, while amended Claim 12 requires ONLY predicting location in the event performing location is not possible. Thus, Dance teaches away from "predicting location results ... when the at least one of the non-overlapping sub-regions **cannot be located by running the fine alignment tool**", as now required by amended claim 12. Consequently, the rejection of claim 12 under 35 USC 103(a) is deemed to be overcome.

Claim 13 has been rejected under 35 USC 103(a) as being unpatentable over Nichani, Ueda, and Companion, as applied to claim 6, and further in view of Aiyer. Regarding claim 13, the arguments analogous to those presented above for claim 5 are applicable to claim 13. Accordingly, the rejection of claim 13 is deemed to be overcome.

Claim 33 has been rejected under 35 USC 103(a) as being unpatentable over Nichani, Ueda, and Companion, as applied to claim 6, and further in view of Clark et al. (US 6,370,197) ("Clark").

Clark does not teach what is claimed in amended claim 33. Clark teaches inspecting each block "to determine whether the data elements for that block may be **represented in a highly compact format**". Only if this condition is **not** met is the data element divided. (see Abstract, lines 5-7) By contrast, Applicants' amended claim 3 requires: "dividing one of the non-overlapping sub-regions into

a plurality of smaller non-overlapping sub-regions when the **one of the non-overlapping sub-regions cannot be located** **using a fine search tool**." If such a non-overlapping sub-region cannot be so-located, the invention teaches that this is most likely due to spatial distortions that are so severe as to make the pattern within the non-overlapping sub-region unrecognizable to the fine search tool. The invention teaches and claims that by dividing the sub-region, the resulting sub-regions will exhibit LESS spatial distortion to an extent that each resulting sub-region WILL be locatable using the fine search tool. Thus, the conditions and goals of Clark and Applicant are very different. In fact, combining Clark with the references cited by the Examiner would not be Applicant's invention as claimed in claim 33. Accordingly, the rejection of claim 33 under 35 USC 103(a) is deemed to be overcome.

Claims 15 and 22 have been rejected under 35 USC 103(a) as being unpatentable over Nichani, and Ueda as applied to claims 14 and 21, and further in view of He. Regarding claims 15 and 22, the arguments analogous to those presented above for claim 7 are applicable to claims 15 and 22. Accordingly, the rejection of claims 15 and 22 is deemed to be overcome.

Claims 18, 26, and 32 have been rejected under 35 USC 103(a) as being unpatentable over Nichani, and Ueda as applied to claims 14, 21 and 27, and further in view of Miyake. Regarding claims 18, 26, and 32, the arguments

analogous to those presented above for claim 11 are applicable to claims 18, 26, and 32. Accordingly, the rejection of claims 18, 26, and 32 is deemed to be overcome.

Claim 19 has been rejected under 35 USC 103(a) as being unpatentable over Nichani, and Ueda as applied to claim 14, and further in view of Dance. Regarding claim 19, the arguments analogous to those presented above for claim 12 are applicable to claim 19. Accordingly, the rejection of claim 19 is deemed to be overcome.

Accordingly, Applicants assert that the present application is in condition for allowance, and such action is respectfully requested. The Examiner is invited to phone the undersigned attorney to further the prosecution of the present application.

Respectfully Submitted,

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